REMARKS

Rejection of Claims 1-19 under 35 U.S.C. §101

Claims 1-19 have been rejected under 35 U.S.C. §101 because the claimed invention allegedly is not supported by either a specific asserted utility or a well established utility. Applicants respectfully disagree and traverse the rejection.

The present application contains abundant utility for the claimed *Zcytor11* polynucleotide, the Zcytor11 protein that it encodes and the antibodies that specifically bind to the Zcytor11 protein.

A. The Claimed Polynucleotides have Utility Because They Bind Near a Disease-Associated Portion of Chromosome 1.

The final utility guides published on January 5, 2001 in Vol. 66 No. 4 of the Federal Register, a copy of which is enclosed for the Examiner's convenience and marked as Exhibit 5, contains a number of comments. The last sentence of comment 4 on page 1095 states,

"A claimed DNA may have a specific and substantial utility because, *e.g.*, it hybridizes near a disease-associated gene or it has a gene-regulating activity."

Page 23 lines 4-15 of the specification states:

"Zcytor11 maps 84.62 cR from the top of the human chromosome a linkage group on the WICGR radiation hybrid map. The use of surrounding markers positioned Zcytor11 in the 1p35.2 to 35.1 region.

Thus Zcytor11 could be used to generate a probe that could allow detection of an aberration of the Zcytor11 gene in the 1p chromosome, which may indicate the presence of a cancerous cells or a predisposition to cancerous cell development. This region of chromosome 1 is frequently involved in visible deletions or loss of heterozygosity in tumors derived from the neural crest cells particularly neuroblastomas and melanomas. For further discussions on developing polynucleotide probes and hybridization see *Current Protocols in Molecular Biology* Ausubel, F. *et al.* Eds. (John Wiley & Sons Inc. 1991)."

Thus, applicants have shown that the *Zcytor11* DNA hybridizes near a disease-associated gene. As evidence of this see Exhibits 1-3 accompanying the present amendment. Exhibit 1 shows the OMIM gene map in the area where the Zcytor11 gene is localized. It shows the cytogenetic map location of disease genes and other expressed genes. As shown by Exhibits 1, 2 and 3, neuroblastomas and melanomas (as disclosed in the present application) as well as leukemia-associated genes are localized in this area. Thus, according to the comments promulgated by the Commissioner of Patents, this is a specific and substantial utility.

B. The Claimed Polynucleotides Possess Utility Because They Encode a Useful Protein

On page 27, lines 24-27, the specification teaches that Zcytor11 is expressed in pancreas with low levels in colon, small intestine and thymus. The receptor mRNA localization suggests that Zcytor11 may regulate gastrointestinal, pancreatic or thymic functions. Thus, the Zcytor11 polypeptide can be used to produce antibodies, which then can used to identify or separate these tissues. THIS IS A REAL WORLD, WELL ESTABLISHED UTILITY. The use of antibodies to Zcytor11 to tag cells is specifically disclosed on page 22 lines 24-25 of the specification.

As evidence of the fact that the use of antibodies to Zcytor11 for tagging cells that express Zcytor11 is a specific and substantial utility, accompanying the present amendment is Exhibit 4, which contains the title pages and pages 156-158 of "Molecular Biology of the Cell", 3rd Ed., Albert, B. *et al.* (Garland Publishing, London & New York, 1994). The text on page 156 of the text teaches the importance of separating cell tissue types to study cells. Pages 157 –158 describe the use of antibodies to separate cell tissue types. Basically, antibodies that bind to the surface of a cell type are coupled to various matrices such as collagen, polysaccharide beads, or plastic to form an affinity surface to which only cells recognized by the antibodies will adhere. The bound cells are then recovered by conventional techniques as is described in the text.

Another method described on page 158 of the text describes separating cells by a fluorescence-activated cell sorter (FACS). In this technique one labels cells with antibodies that are coupled to a fluorescent dye. The labeled cells are then separated from unlabeled cells in a

FACS machine. In FACS sorting individual cells traveling in single file pass through a laser beam and the fluorescence of each cell is measured. Slightly further down-stream, tiny droplets, most containing either one or no cells, are formed by a vibrating nozzle. The droplets containing a single cell are automatically given a positive or negative charge at the moment of formation, depending on whether the cell they contain is fluorescent, and then deflected by a strong electric field into an appropriate container. Such machines can select 1 cell in 1000 and sort about 5000 cells each second. This produces a uniform population of cells for cell culture.

This is evidence that the antibodies to the Zcytor11 polypeptides have a SPECIFIC UTILITY, because not all tissue types express the Zcytor11 receptor, and SUBSTANTIAL UTILITY, because it is important that biologists be able to separate specific cell types for further study or therapeutic re-implantation into the body. Thus, the antibodies are being used for their unique properties that can be used immediately by scientists for the unique properties of the antibodies. Thus, the Zcytor11 polypeptide has utility because it is needed to produce the antibodies, and polynucleotides that encode the Zycytor11 polypeptide have utility because they can be used to produce the polypeptides that produce the antibodies.

C. The Claimed Polynucleotides Can be Used to Tag Chromosomes

Another well established utility that the antibodies have is that they can be labeled, generally with fluorescence, and a surgeon can apply them to a surgical field to determine whether or not all of the tissue that is need to be excised is excised. Specifically, antibodies to Zcytor11 can be labeled with fluorescence and applied to the surgical field after the surgeon has removed a pancreas to be certain that all of the pancreatic tissue has been removed. This is a WELL-ESTABLISHED UTILITY, which is SPECIFIC and SUBSTANTIAL. This is yet another reason why the antibodies to the Zcytor11 polypeptide, the Zcytor11 polypeptide, and the polynucleotides that encode the Zcytor11 polypeptide possess utility.

Labeled polynucleotide probes of SEQ ID NO: 1, or corresponding RNA or antisense polynucleotides can be further used as chromosome tags to tag chromosome 1 as is described by Example 4 pages 27-28 of the specification. This is another specific and substantial utility. Labeled polynucleotide probes of SEQ ID NO: 1 can also be used to identify the tissues listed in the specification that express Zcytor11.

The utilities of the claimed invention described above provide immediate benefit to the public. That is all that is required under 35 U.S.C. §101. Applicants request that the rejection of Claims 1-19 be withdrawn and the claims allowed.

Rejection of the Claims under 35 U.S.C. §112 second paragraph

The claims have been amended as the Examiner has suggested. Applicants request that the rejection of the claims under 35 U.S.C. §112 second paragraph be withdrawn and the claims allowed.

Respectfully submitted;

Paul G. Lunn, Esq.
Reg. No: 32,743
(206) 442-6627

CERTIFICATE OF MAILING [37 CFR 1.8(a)]

I hereby certify that this correspondence and all items mentioned herein are being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the: Assistant Commissioner for Patents, Washington, DC 20231 on February 23, 2001.

Signature

Paul G. Lunn